

REMARKS

Summary of Amendments/Status of Claims

Claims 1, 2 and 6-11 have been amended, claims 3 and 13 have been canceled, and new claims 17-42 have been added.

Official fees for 20 claims in excess of twenty are being submitted with the present reply. That is, (claims 1 through 42) – (2 canceled claims) = 40 total claims, or 20 excess claims, with no excess independent claims.

Support for New Claims

New claims 17 and 18 are supported by, for example, paragraph [0011] of the specification as filed. Claims 19-28 and 37-42 are supported by previously presented claim 6 (that is, as presented in Applicant's preliminary amendment of April 28, 2006). Claim 29 is supported by previously presented claim 4; claim 30 is supported by previously presented claim 5; claims 31 and 33-36 are supported by previously presented claim 7; and claim 32 is supported by previously presented claim 9.

Claim Rejections – 35 U.S.C. § 112

Claims 1-3 and 7-13 were rejected for lack of clarity as to the intended meaning of "principal" as used therein. Applicant explains that in the claims the phrase "a phase having as the principal component . . . carbon" means that the phase is constituted by carbon, with unavoidable impurities mixed into the remaining portion. By the present amendments, the syntax of the claims in which this phrase appears has been revised to eliminate the ambiguity pointed out by the Examiner. (And the rejection is moot as to claims 3 and 13, since they have been canceled.)

Claims 1, 2, 7 and 10 were rejected as being indefinite for the use, parenthetically, of the term "(with the proviso that)." By the present amendments, this term has been eliminated and replaced by a phrase unambiguously reciting that the ceramic or ceramic constituent is one that "excludes pure carbon allotropes."

Claims 6, 8, 11, and 16 were rejected as being indefinite for an apparent contradiction in that these dependent claims' parent claims exclude carbon from the recited ceramic phase, yet these dependent claims recite that the ceramic phase can be composed of carbon-containing ceramics. To redress this problem, the exclusionary language concerning the ceramic phase has been revised—following on a tacit suggestion the Examiner makes in the text of this rejection—to make clear that the excluded carbon is "pure carbon allotropes," as just noted in the previous paragraph.

Claim Rejections – 35 U.S.C. § 102

Claims 1, 3, 4 and 5 stand rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Pat. No. 5,728,637 to Mishra et al.

In turn, claims 1-6 and 13-16 stand rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Pat. No. 5,690,706 to Sigalas et al.

Meanwhile, claims 1-6 and 13-16 stand rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Pat. No. 6,420,293 to Chang et al.

These separate rejections will be addressed concurrently.

Applicant points out that *Mishra et al.* is directed to an aluminum–diamond composite material in which the grain size of the diamond is 0-100 nm, and of the alumina, 29 nm. The diamond content is 7.5 vol.%, and the hardness of the composite is 32 GPa.

By the present amendments, aluminum has been eliminated from the claims; thus the claims do not relate to oxides of aluminum. Moreover, the carbon (which can be diamond according to new claim 17) content has by the present amendments been revised to 40 wt.% or more, and with the diamond content in *Mishra et al.* being 7.5 vol.%, it is a full 30 wt.% below the limit now recited in the claims.

Applicant notes that in *Sigalas et al.* the diamond grains size is 1 nm, and the alumina grain size is 50 nm or less, with the diamond content being 35 vol.% or less.

By the present amendments, aluminum has been eliminated from the claims; thus the claims do not relate to oxides of aluminum. Moreover, with the density of diamond being 3.5 and that of alumina being 4.0, and their content being 35 vol. % and 30 wt.%, the diamond proportion does not meet the 40 wt.% lower limit of the content for the carbon-containing phase of a ceramic composite as now recited in the claims.

Concerning *Chang et al.*, Applicant points out that the reference is directed to carbon nanotube applications, wherein the nanotube content is 50 vol.%.

The claims have been amended so as not to include carbon nanotubes. Applicant notes that nanotubes are extremely bulky, such that even at 50 vol.%, they would constitute not more than 30 wt.% in content—well below the 40 wt.% lower limit of the content for the carbon-containing phase of a ceramic composite as now recited in the claims.

It is respectfully submitted that for the foregoing reasons, based upon the present amendments the claims rejected in three separate instances under § 102 should be held allowable.

Claim Rejections – 35 U.S.C. § 103

Claims 7-9: *Mishra et al.* '637 in view of Tomaszewski et al. (Non-Patent Literature)

Claims 7-9 were rejected as being unpatentable over *Mishra et al.* as applied to claim 1 and 13-16, in view of the *Journal of Materials Science Letters* article by Tomaszewski et al.

It is respectfully submitted that for the foregoing reasons presented in addressing the § 102 rejections, *Mishra et al.* is no longer applicable as a reference, and thus the presently addressed rejection based on *Mishra et al.* in combination with *Tomaszewski et al.* has been rendered moot.

Claims 10-12: *Mishra et al.* in view of Tomaszewski et al., and further in view of Sigalas et al. '706 and Chen et al. (Non-Patent Literature)

Claims 10-12 were rejected as being unpatentable *Mishra et al.* in view of *Tomaszewski et al.* as applied to claims 7-9, and further in view of *Sigalas et al.* and the *Physical Review* article by Chen et al.

It is respectfully submitted that for the foregoing reasons presented in addressing the § 102 rejections, neither *Mishra et al.* nor *Sigalas et al.* is any longer applicable as a reference, and thus the presently addressed rejection based on *Mishra et al.* and *Sigalas et al.* in combination with *Tomaszewski et al.* and *Chen et al.* has been rendered moot.

Double Patenting

It is noted on Applicant's behalf that the double patenting rejection is provisional. Accordingly, it is respectfully requested that this rejection be held in abeyance until it is determined whether claim 1 (as including the limitations of canceled claim 3) is allowable. If so, then Applicant will cancel claim 2 (as including the limitations of canceled claim 13 and being a substantial duplicate of claim 1). On the other hand, it may be in Applicant's best interest to cancel claim 1 if claim 2 is determined to be allowable, but not claim 1. Given that based on the amendments to both claims, reconsideration of their merits is being requested, it is believed that the present request that the double-patenting rejection be held in abeyance is reasonable.

Conclusion

Accordingly, Applicant courteously urges that this application is in condition for allowance. Reconsideration and withdrawal of the rejections is requested. Favorable action by the Examiner at an early date is solicited.

Respectfully submitted,

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